

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1-54 (cancelled)

55. (New) An exposure apparatus which exposes an object with an illumination beam through a mask, comprising:

an illumination optical system provided on an optical path through which the illumination beam passes to illuminate the mask with the illumination beam in each of illumination modes in which the illumination beam has different intensity distributions from each other on a pupil plane of the illumination optical system and which include on-axis and off-axis illumination modes, one of the different intensity distributions in the off-axis illumination mode having an increased intensity portion apart from an optical axis of the illumination optical system relative to a portion of the one intensity distribution on the optical axis; and

a shaping optical system provided on the optical path in the illumination optical system to shape each of the different intensity distributions, that includes first optical members on the optical axis of which at least one is movable in a direction

along the optical axis to change the one intensity distribution in the off-axis illumination mode so that the increased intensity portion of the one intensity distribution is variable, and another one of the different intensity distributions in the on-axis illumination mode, respectively.

56. (New) An apparatus according to claim 55, wherein said first optical members include first optical elements of which at least one is movable in said direction to change the one and the another one intensity distributions in said off-axis and on-axis illumination modes, respectively, and second optical elements of which at least one is movable in said direction to change the one intensity distribution in said off-axis illumination mode.

57. (New) An apparatus according to claim 56, wherein said second optical elements include prisms of which at least one is movable in said direction and between which an interval in said direction is variable by the at least one prism to change at least a position, relative to said optical axis on said pupil plane, of the increased intensity portion of said one intensity distribution in said off-axis illumination mode.

58. (New) An apparatus according to claim 57, wherein said first optical elements include zoom lenses relatively movable in said direction to change at least sizes, on said pupil plane, of the increased intensity portion of the one intensity distribution in said off-axis illumination mode and of said illumination beam having the another one intensity distribution in said on-axis illumination mode, respectively.

59. (New) An apparatus according to claim 58, wherein said off-axis illumination mode includes a multipole mode in which said one intensity distribution has increased intensity portions, apart from said optical axis relative to said portion on said optical axis, of which distances from said optical axis are substantially equal and variable by said shaping optical system.

60. (New) An apparatus according to claim 59, wherein said multipole mode includes at least one of a dipole mode in which said increased intensity portions are two to illuminate a mask of which a pattern includes features periodically arranged in one direction with said illumination beam of which said one intensity distribution has the two increased intensity portions on said pupil plane, and a quadrupole mode in which said increased

intensity portions are four to illuminate a mask of which a pattern includes features periodically arranged in two different directions with said illumination beam of which said one intensity distribution has the four increased intensity portions on said pupil plane.

61. (New) An apparatus according to claim 56, wherein said off-axis illumination mode includes a multipole mode in which said one intensity distribution has increased intensity portions, apart from said optical axis relative to said portion on said optical axis, of which distances from said optical axis are substantially equal and variable by said shaping optical system.

62. (New) An apparatus according to claim 61, wherein said multipole mode includes at least one of a dipole mode in which said increased intensity portions are two to illuminate a mask of which a pattern includes features periodically arranged in one direction with said illumination beam of which said one intensity distribution has the two increased intensity portions on said pupil plane, and a quadrupole mode in which said increased intensity portions are four to illuminate a mask of which a pattern includes features periodically arranged in two

different directions with said illumination beam of which said one intensity distribution has the four increased intensity portions on said pupil plane.

63. (New) An apparatus according to claim 55, wherein said first optical members include prisms of which at least one is movable in said direction and between which an interval in said direction is variable by the at least one prism to change at least a position, relative to said optical axis on said pupil plane, of the increased intensity portion of said one intensity distribution in said off-axis illumination mode.

64. (New) An apparatus according to claim 63, wherein said off-axis illumination mode includes a multipole mode in which said one intensity distribution has increased intensity portions, apart from said optical axis relative to said portion on said optical axis, of which distances from said optical axis are substantially equal and variable by said shaping optical system.

65. (New) An apparatus according to claim 64, wherein said multipole mode includes at least one of a dipole mode in which said increased intensity portions are two to illuminate

a mask of which a pattern includes features periodically arranged in one direction with said illumination beam of which said one intensity distribution has the two increased intensity portions on said pupil plane, and a quadrupole mode in which said increased intensity portions are four to illuminate a mask of which a pattern includes features periodically arranged in two different directions with said illumination beam of which said one intensity distribution has the four increased intensity portions on said pupil plane.

66. (New) An apparatus according to claim 55, wherein at least one of a position, relative to said optical axis, and a size of the increased intensity portion of said one intensity distribution in said off-axis illumination mode is variable by at least said first optical members.

67. (New) An apparatus according to claim 66, wherein said off-axis illumination mode includes a multipole mode in which said one intensity distribution has increased intensity portions, apart from said optical axis relative to said portion on said optical axis, of which distances from said optical axis are substantially equal and variable by said shaping optical system.

68. (New) An apparatus according to claim 67, wherein said multipole mode includes at least one of a dipole mode in which said increased intensity portions are two to illuminate a mask of which a pattern includes features periodically arranged in one direction with said illumination beam of which said one intensity distribution has the two increased intensity portions on said pupil plane, and a quadrupole mode in which said increased intensity portions are four to illuminate a mask of which a pattern includes features periodically arranged in two different directions with said illumination beam of which said one intensity distribution has the four increased intensity portions on said pupil plane.

69. (New) An apparatus according to claim 55, wherein said off-axis illumination mode includes a multipole mode in which said one intensity distribution has increased intensity portions, apart from said optical axis relative to said portion on said optical axis, of which distances from said optical axis are substantially equal with respect to a direction in which a pattern of said mask is periodically arranged.

70. (New) An apparatus according to claim 69, wherein

said multipole mode includes at least one of a dipole mode in which said increased intensity portions are two to illuminate a mask of which a pattern includes features periodically arranged in one direction with said illumination beam of which said one intensity distribution has the two increased intensity portions on said pupil plane, and a quadrupole mode in which said increased intensity portions are four to illuminate a mask of which a pattern includes features periodically arranged in two different directions with said illumination beam of which said one intensity distribution has the four increased intensity portions on said pupil plane.

71. (New) An apparatus according to claim 70, wherein said two increased intensity portions in said dipole mode are respectively arranged at positions, on said pupil plane, of which distances from said optical axis with respect to said one direction are substantially equal.

72. (New) An apparatus according to claim 70, wherein said four increased intensity portions in said quadrupole mode are respectively arranged at positions, on said pupil plane, of which first distances from said optical axis with respect to one of said two different directions are substantially equal



and of which second distances from said optical axis with respect to another of said two different directions are substantially equal.

73. (New) An apparatus according to claim 69, wherein said shaping optical system includes second optical members of which one is provided on said optical path to shape said one intensity distribution having said increased intensity portions in said multipole mode and is exchanged for another one of the second optical members to shape a different intensity distribution of said illumination beam from said one intensity distribution.

74. (New) An apparatus according to claim 73, wherein said multipole mode includes at least one of a dipole mode in which said increased intensity portions are two to illuminate a mask of which a pattern includes features periodically arranged in one direction with said illumination beam of which said one intensity distribution has the two increased intensity portions on said pupil plane, and a quadrupole mode in which said increased intensity portions are four to illuminate a mask of which a pattern includes features periodically arranged in two different directions with said illumination beam of which said

one intensity distribution has the four increased intensity portions on said pupil plane.

75. (New) An apparatus according to claim 73, wherein said illumination optical system includes a shielding member provided on said optical path to prevent from reaching said mask unwanted light generated in said shaping optical system.

76. (New) An apparatus according to claim 75, wherein said second optical members are deflection optical elements, and said unwanted light is generated from one of the deflection optical elements provided on said optical path.

77. (New) An apparatus according to claim 76, wherein at least one of said deflection optical elements provided on said optical path in said multipole mode generates a deflected beam in a different direction from said optical axis with said illumination beam.

78. (New) An apparatus according to claim 77, wherein said at least one deflection optical element provided on said optical path in said multipole mode is a diffraction optical element that restrains generation of a beam in said direction

along said optical axis.

79. (New) An apparatus according to claim 55, wherein said shaping optical system includes second optical members of which one is provided on said optical path to shape said one intensity distribution in said off-axis illumination mode and is exchanged for another one of the second optical members to shape a different intensity distribution of said illumination beam from said one intensity distribution.

80. (New) An apparatus according to claim 79, wherein said different intensity distribution is shaped on said pupil plane in said off-axis illumination mode by the another one of said second optical members.

81. (New) An apparatus according to claim 79, wherein said illumination optical system includes a shielding member provided on said optical path to prevent from reaching said mask unwanted light generated in said shaping optical system.

82. (New) An apparatus according to claim 79, wherein said second optical members are deflection optical elements, and at least one of the deflection optical elements provided

on said optical path in said off-axis illumination mode generates a deflected beam in a different direction from said optical axis with said illumination beam.

83. (New) An apparatus according to claim 82, wherein said at least one deflection optical element provided on said optical path in said off-axis illumination mode is a diffraction optical element that restrains generation of a beam in said direction along said optical axis.

84. (New) An apparatus according to claim 55, wherein said illumination optical system includes a shielding member provided on said optical path to prevent from reaching said mask unwanted light generated in said shaping optical system.

85. (New) An exposure apparatus which exposes an object with an illumination beam through a mask, comprising:

an illumination optical system provided on an optical path through which the illumination beam passes to illuminate the mask with the illumination beam in each of illumination modes in which the illumination beam has different intensity distributions from each other on a pupil plane of the illumination optical system and which include on-axis and

off-axis illumination modes, one of the different intensity distributions in the off-axis illumination mode having an increased intensity portion apart from an optical axis of the illumination optical system relative to a portion of the one intensity distribution on the optical axis; and

a shaping optical system provided on the optical path in the illumination optical system to shape each of the different intensity distributions, that includes a deflection optical element to generate a deflected beam with the illumination beam and an array optical device both provided on the optical path in the off-axis illumination mode to shape the one intensity distribution having the increased intensity portion by distributing the deflected beam from the deflection optical element on the pupil plane through the array optical device having a plurality of optical elements two-dimensionally arranged on a plane perpendicular to the optical axis.

86. (New) An apparatus according to claim 85, wherein said shaping optical system has a plurality of deflection optical elements of which one is provided on said optical path in said off-axis illumination mode and is exchanged for another one of the deflection optical elements to shape a different intensity distribution of said illumination beam from said one intensity

distribution.

87. (New) An apparatus according to claim 86, wherein said shaping optical system has array optical devices of which one is provided on said optical path in said off-axis illumination mode and is exchanged for another one of the array optical devices to shape said different intensity distribution.

88. (New) An apparatus according to claim 85, wherein said shaping optical system has array optical devices of which one is provided on said optical path in said off-axis illumination mode and is exchanged for another one of the array optical devices to shape a different intensity distribution from said one intensity distribution.

89. (New) An apparatus according to claim 86, wherein said deflection optical element provided on said optical path in said off-axis illumination mode is a diffraction optical element which restrains generation of a beam in a direction along said optical axis.

90. (New) An apparatus according to claim 87, wherein said illumination optical system includes a shielding member

provided on said optical path to prevent from reaching said mask unwanted light generated in said shaping optical system.

91. (New) An apparatus according to claim 85, wherein said off-axis illumination mode includes a multipole mode in which said one intensity distribution has increased intensity portions, apart from said optical axis relative to said portion on said optical axis, of which distances from said optical axis are substantially equal with respect to a direction in which a pattern of said mask is periodically arranged.

92. (New) An apparatus according to claim 91, wherein said multipole mode includes at least one of a dipole mode in which said increased intensity portions are two to illuminate a mask of which a pattern includes features periodically arranged in one direction with said illumination beam of which said one intensity distribution has the two increased intensity portions on said pupil plane, and a quadrupole mode in which said increased intensity portions are four to illuminate a mask of which a pattern includes features periodically arranged in two different directions with said illumination beam of which said one intensity distribution has the four increased intensity portions on said pupil plane.

93. (New) An apparatus according to claim 92, wherein said two increased intensity portions in said dipole mode are respectively arranged at positions, on said pupil plane, of which distances from said optical axis with respect to said one direction are substantially equal.

94. (New) An apparatus according to claim 92, wherein said four increased intensity portions in said quadrupole mode are respectively arranged at positions, on said pupil plane, of which first distances from said optical axis with respect to one of said two different directions are substantially equal and of which second distances from said optical axis with respect to another of said different two directions are substantially equal.

95. (New) An apparatus according to claim 92, wherein said deflection optical element is a diffraction optical element which restrains generation of a beam in a direction along said optical axis in said off-axis illumination mode.

96. (New) An apparatus according to claim 92, wherein said illumination optical system includes a shielding member



provided on said optical path to prevent from reaching said mask unwanted light generated in said shaping optical system.

97. (New) An apparatus according to claim 85, wherein said deflection optical element is a diffraction optical element which restrains generation of a beam in a direction along said optical axis in said off-axis illumination mode.

98. (New) An apparatus according to claim 85, wherein said illumination optical system includes a shielding member provided on said optical path to prevent from reaching said mask unwanted light generated in said shaping optical system.

99. (New) An exposure apparatus which exposes an object with an illumination beam through a mask, comprising:

an illumination optical system provided on an optical path through which the illumination beam passes to illuminate the mask with the illumination beam in each of illumination modes in which the illumination beam has different intensity distributions from each other on a pupil plane of the illumination optical system and which include on-axis and off-axis illumination modes, one of the different intensity distributions in the off-axis illumination mode having an

increased intensity portion apart from an optical axis of the illumination optical system relative to a portion of the one intensity distribution on the optical axis; and

a shaping optical system provided on the optical path in the illumination optical system, that includes a first unit having first optical devices on a first holding member, of which one is provided on the optical path to shape the one intensity distribution, and is exchanged for another one of the first optical devices by moving the first holding member to shape an intensity distribution different from the one intensity distribution, and a second unit having second optical devices on a second holding member, of which one is provided on the optical path when the one intensity distribution is shaped, and is exchanged for another one of the second optical devices by moving the second holding member when an intensity distribution different from the one intensity distribution is shaped.

100. (New) An apparatus according to claim 99, wherein said illumination beam from the another one of said first optical devices provided on said optical path to shape said intensity distribution different from said one intensity distribution is distributed on said pupil plane through one of said second optical devices provided on said optical path.

101. (New) An apparatus according to claim 99, wherein said illumination beam from one of said first optical devices provided on said optical path is distributed on said pupil plane through the another one of said second optical devices provided on said optical path when said intensity distribution different from said one intensity distribution is shaped.

102. (New) An apparatus according to claim 99, wherein said off-axis illumination mode includes a multipole mode in which said one intensity distribution has increased intensity portions, apart from said optical axis relative to said portion on said optical axis, of which distances from said optical axis are substantially equal with respect to a direction in which a pattern of a mask is periodically arranged.

103. (New) An apparatus according to claim 102, wherein said multipole mode includes at least one of a dipole mode in which said increased intensity portions are two to illuminate a mask of which a pattern includes features periodically arranged in one direction with said illumination beam of which said one intensity distribution has the two increased intensity portions on said pupil plane, and a quadrupole mode in which said increased

intensity portions are four to illuminate a mask of which a pattern includes features periodically arranged in two different directions with said illumination beam of which said one intensity distribution has the four increased intensity portions on said pupil plane.

104. (New) An apparatus according to claim 103, wherein said two increased intensity portions in said dipole mode are respectively arranged at positions, on said pupil plane, of which distances from said optical axis with respect to said one direction are substantially equal.

105. (New) An apparatus according to claim 103, wherein said four increased intensity portions in said quadrupole mode are respectively arranged at positions, on said pupil plane, of which first distances from said optical axis with respect to one of said two different directions are substantially equal and of which second distances from said optical axis with respect to another of said two different directions are substantially equal.

106. (New) An apparatus according to claim 99, wherein said shaping optical system includes a guide optical system

provided on said optical path between said first and second units to direct said illumination beam from one of said first optical devices on said optical path to one of said second optical devices on said optical path.

107. (New) An apparatus according to claim 99, wherein said shaping optical system includes zoom lenses relatively movable in a direction along said optical axis to change at least a size, on said pupil plane, of the increased intensity portion of said one intensity distribution in said off-axis illumination mode.

108. (New) An apparatus according to claim 99, wherein said illumination optical system includes a shielding member provided on said optical path to prevent from reaching said mask unwanted light generated in said shaping optical system.

109. (New) An exposure apparatus which exposes an object with an illumination beam through a mask, comprising:

an illumination optical system provided on an optical path through which the illumination beam passes, that includes a plurality of optical members of which one has incidence and exit surfaces substantially perpendicular to an optical axis of the

illumination optical system and is movable in a first direction perpendicular to the optical axis, to illuminate the mask with the illumination beam through the plurality of optical members in each of illumination modes in which the illumination beam has different intensity distributions from each other on a pupil plane of the illumination optical system and which include on-axis and off-axis illumination modes, one of the different intensity distributions in the off-axis illumination mode having an increased intensity portion apart from the optical axis relative to a portion of the one intensity distribution on the optical axis; and

a shaping optical system provided on the optical path in the illumination optical system, that includes first and second optical members different from the movable one of the plurality of optical members to shape each of the different intensity distributions, the first optical members being relatively movable in a second direction along the optical axis, and one of the second optical members being provided on the optical path in the off-axis illumination mode to shape the one intensity distribution and exchanged for another one of the second optical members to shape a different intensity distribution from the one intensity distribution.

110. (New) An apparatus according to claim 109, wherein said off-axis illumination mode includes a multipole mode in which said one intensity distribution has increased intensity portions, apart from said optical axis relative to said portion on said optical axis, of which distances from said optical axis are substantially equal with respect to a direction in which a pattern of a mask is periodically arranged.

111. (New) An apparatus according to claim 110, wherein said multipole mode includes at least one of a dipole mode in which said increased intensity portions are two to illuminate a mask of which a pattern includes features periodically arranged in one direction with said illumination beam of which said one intensity distribution has the two increased intensity portions on said pupil plane, and a quadrupole mode in which said increased intensity portions are four to illuminate a mask of which a pattern includes features periodically arranged in two different directions with said illumination beam of which said one intensity distribution has the four increased intensity portions on said pupil plane.

112. (New) An apparatus according to claim 111, wherein said two increased intensity portions in said dipole mode are

respectively arranged at positions, on said pupil plane, of which distances from said optical axis with respect to said one direction are substantially equal.

113. (New) An apparatus according to claim 111, wherein said four increased intensity portions in said quadrupole mode are respectively arranged at positions, on said pupil plane, of which first distances from said optical axis with respect to one of said two different directions are substantially equal and of which second distances from said optical axis with respect to another of said two different directions are substantially equal.

114. (New) An apparatus according to claim 109, wherein said illumination optical system includes a shielding member provided on said optical path to prevent from reaching said mask unwanted light generated in said shaping optical system.

115. (New) An illumination apparatus provided in an exposure apparatus which exposes an object with an illumination beam through a mask to illuminate with the illumination beam an area on a predetermined plane on which a pattern surface of the mask is placed, comprising:



an illumination optical system provided on an optical path through which the illumination beam passes, that includes a plurality of optical members arranged along an optical axis substantially perpendicular to the predetermined plane to illuminate the area in each of illumination modes in which the illumination beam has different intensity distributions from each other on a pupil plane of the illumination optical system and which includes on-axis and off-axis illumination modes, one of the different intensity distributions in the off-axis illumination mode having an increased intensity portion apart from the optical axis relative to a portion of the one intensity distribution on the optical axis; and

a shaping optical system provided on the optical path in the illumination optical system to shape each of the different intensity distributions, that includes first optical members on the optical axis, of which at least one is movable in a direction along the optical axis to change the one intensity distribution in the off-axis illumination mode so that the increased intensity portion of the one intensity distribution is variable, and another one of the different intensity distributions in the on-axis illumination mode, respectively.

116. (New) An apparatus according to claim 115, wherein

said first optical members include first optical elements of which at least one is movable in said direction to change the one and the another one intensity distributions in said off-axis and on-axis illumination modes respectively, and second optical elements of which at least one is movable in said direction to change the one intensity distribution in said off-axis illumination mode.

117. (New) An apparatus according to claim 116, wherein said second optical elements include prisms of which at least one is movable in said direction and between which an interval in said direction is variable by the at least one prism to change at least a position, relative to said optical axis on said pupil plane, of the increased intensity portion of said one intensity distribution in said off-axis illumination mode.

118. (New) An apparatus according to claim 117, wherein said first optical elements include zoom lenses relatively movable in said direction to change at least sizes, on said pupil plane, of the increased intensity portion of the one intensity distribution in said off-axis illumination mode and of said illumination beam having the another one intensity distribution in said on-axis illumination mode respectively.

119. (New) An apparatus according to claim 118, wherein said off-axis illumination mode includes a multipole mode in which said one intensity distribution has increased intensity portions, apart from said optical axis relative to said portion on said optical axis, of which distances from said optical axis are substantially equal and variable by said shaping optical system.

120. (New) An apparatus according to claim 115, wherein said off-axis illumination mode includes a multipole mode in which said one intensity distribution has increased intensity portions, apart from said optical axis relative to said portion on said optical axis, of which distances from said optical axis are substantially equal and variable by said shaping optical system.

121. (New) An apparatus according to claim 120, wherein said shaping optical system includes second optical members of which one is provided on said optical path to shape said one intensity distribution having said increased intensity portions in said multipole mode and is exchanged for another one of the second optical members to shape a different intensity

distribution of said illumination beam from said one intensity distribution.

122. (New) An apparatus according to claim 121, wherein said illumination optical system includes a shielding member provided on said optical path to prevent from reaching said mask unwanted light generated in said shaping optical system.

123. (New) An apparatus according to claim 115, wherein said shaping optical system includes second optical members of which one is provided on said optical path to shape said one intensity distribution in said off-axis illumination mode and is exchanged for another one of the second optical members to shape a different intensity distribution of said illumination beam from said one intensity distribution.

124. (New) An apparatus according to claim 123, wherein said illumination optical system includes a shielding member provided on said optical path to prevent from reaching said mask unwanted light generated in said shaping optical system.

125. (New) An apparatus according to claim 123, wherein said second optical members are deflection optical elements,

and at least one of the deflection optical elements provided on said optical path in said off-axis illumination mode generates a deflected beam in a different direction from said optical axis with said illumination beam.

126. (New) An apparatus according to claim 125, wherein said at least one deflection optical element provided on said optical path in said off-axis illumination mode is a diffraction optical element that restrains generation of a beam in said direction along said optical axis.

127. (New) An apparatus according to claim 115, wherein said illumination optical system includes a shielding member provided on said optical path to prevent from reaching said mask unwanted light generated in said shaping optical system.

128. (New) An illumination apparatus provided in an exposure apparatus which exposes an object with an illumination beam through a mask to illuminate with the illumination beam an area on a predetermined plane on which a pattern surface of the mask is placed, comprising:

an illumination optical system provided on an optical path through which the illumination beam passes, that includes a

plurality of optical members arranged along an optical axis substantially perpendicular to the predetermined plane to illuminate the area in each of illumination modes in which the illumination beam has different intensity distributions from each other on a pupil plane of the illumination optical system and which includes on-axis and off-axis illumination modes, one of the different intensity distributions in the off-axis illumination mode having an increased intensity portion apart from the optical axis relative to a portion of the one intensity distribution on the optical axis; and

a shaping optical system provided on the optical path in the illumination optical system to shape each of the different intensity distributions, that includes a deflection optical element to generate a deflected beam with the illumination beam and an array optical device both provided on the optical path in the off-axis illumination mode to shape the one intensity distribution having the increased intensity portion by distributing the deflected beam from the deflection optical element on the pupil plane through the array optical device having a plurality of optical elements two-dimensionally arranged on a plane perpendicular to the optical axis.

129. (New) An apparatus according to claim 128, wherein said shaping optical system has a plurality of deflection optical elements of which one is provided on said optical path in said off-axis illumination mode and is exchanged for another one of the deflection optical elements to shape a different intensity distribution of said illumination beam from said one intensity distribution.

130. (New) An apparatus according to claim 129, wherein said shaping optical system has a plurality of array optical devices of which one is provided on said optical path in said off-axis illumination mode and is exchanged for another one of the array optical devices to shape said different intensity distribution.

131. (New) An apparatus according to claim 128, wherein said shaping optical system has a plurality of array optical devices of which one is provided on said optical path in said off-axis illumination mode and is exchanged for another one of the array optical devices to shape a different intensity distribution from said one intensity distribution.

132. (New) An apparatus according to claim 128, wherein said off-axis illumination mode includes a multipole mode in which said one intensity distribution has increased intensity portions, apart from said optical axis relative to said portion on said optical axis, of which distances from said optical axis are substantially equal and variable by said shaping optical system.

133. (New) An apparatus according to claim 128, wherein said illumination optical system includes a shielding member provided on said optical path to prevent from reaching said mask unwanted light generated in said shaping optical system.

134. (New) An illumination apparatus provided in an exposure apparatus which exposes an object with an illumination beam through a mask to illuminate with the illumination beam an area on a predetermined plane on which a pattern surface of the mask is placed, comprising:

an illumination optical system provided on an optical path through which the illumination beam passes, that includes a plurality of optical members arranged along an optical axis substantially perpendicular to the predetermined plane to illuminate the area in each of illumination modes in which the



illumination beam has different intensity distributions from each other on a pupil plane of the illumination optical system and which includes on-axis and off-axis illumination modes, one of the different intensity distributions in the off-axis illumination mode having an increased intensity portion apart from the optical axis relative to a portion of the one intensity distribution on the optical axis; and

a shaping optical system provided on the optical path in the illumination optical system, that includes a first unit having first optical devices on a first holding member, of which one is provided on the optical path to shape the one intensity distribution, and is exchanged for another one of the first optical devices by moving the first holding member to shape an intensity distribution different from the one intensity distribution, and a second unit having second optical devices on a second holding member, of which one is provided on the optical path when the one intensity distribution is shaped, and is exchanged for another one of the second optical devices by moving the second holding member when an intensity distribution different from the one intensity distribution is shaped.

135. (New) An apparatus according to claim 134, wherein said illumination beam from the another one of said first optical

devices provided on said optical path to shape said intensity distribution different from said one intensity distribution is distributed on said pupil plane through one of said second optical devices provided on said optical path.

136. (New) An apparatus according to claim 134, wherein said illumination beam from the one of said first optical devices provided on said optical path is distributed on said pupil plane through the another one of said second optical devices provided on said optical path when said intensity distribution different from said one intensity distribution is shaped.

137. (New) An apparatus according to claim 134, wherein said off-axis illumination mode includes a multipole mode in which said one intensity distribution has increased intensity portions, apart from said optical axis relative to said portion on said optical axis, of which distances from said optical axis are substantially equal and variable by said shaping optical system.

138. (New) An apparatus according to claim 134, wherein said illumination optical system includes a shielding member provided on said optical path to prevent from reaching said mask

unwanted light generated in said shaping optical system.

139. (New) An illumination apparatus provided in an exposure apparatus which exposes an object with an illumination beam through a mask to illuminate with the illumination beam an area on a predetermined plane on which a pattern surface of the mask is placed, comprising:

an illumination optical system provided on an optical path through which the illumination beam passes, that includes a plurality of optical members of which one is movable in a first direction perpendicular to an optical axis of the illumination optical system to illuminate the area in each of illumination modes in which the illumination beam has different intensity distributions from each other on a pupil plane of the illumination optical system and which include on-axis and off-axis illumination modes, one of the different intensity distributions in the off-axis illumination mode having an increased intensity portion apart from the optical axis relative to a portion of the one intensity distribution on the optical axis; and

a shaping optical system provided on the optical path in the illumination optical system, that includes first and second optical members different from the movable one of the plurality

of optical members to shape each of the different intensity distributions, the first optical members being relatively movable in a second direction along the optical axis, and one of the second optical members being provided on the optical path in the off-axis illumination mode to shape the one intensity distribution and exchanged for another one of the second optical members to shape a different intensity distribution from the one intensity distribution.

140. (New) An apparatus according to claim 139, wherein said off-axis illumination mode includes a multipole mode in which said one intensity distribution has increased intensity portions, apart from said optical axis relative to said portion on said optical axis, of which distances from said optical axis are substantially equal and variable by said shaping optical system.

141. (New) An apparatus according to claim 139, wherein said illumination optical system includes a shielding member provided on said optical path to prevent from reaching said mask unwanted light generated in said shaping optical system.